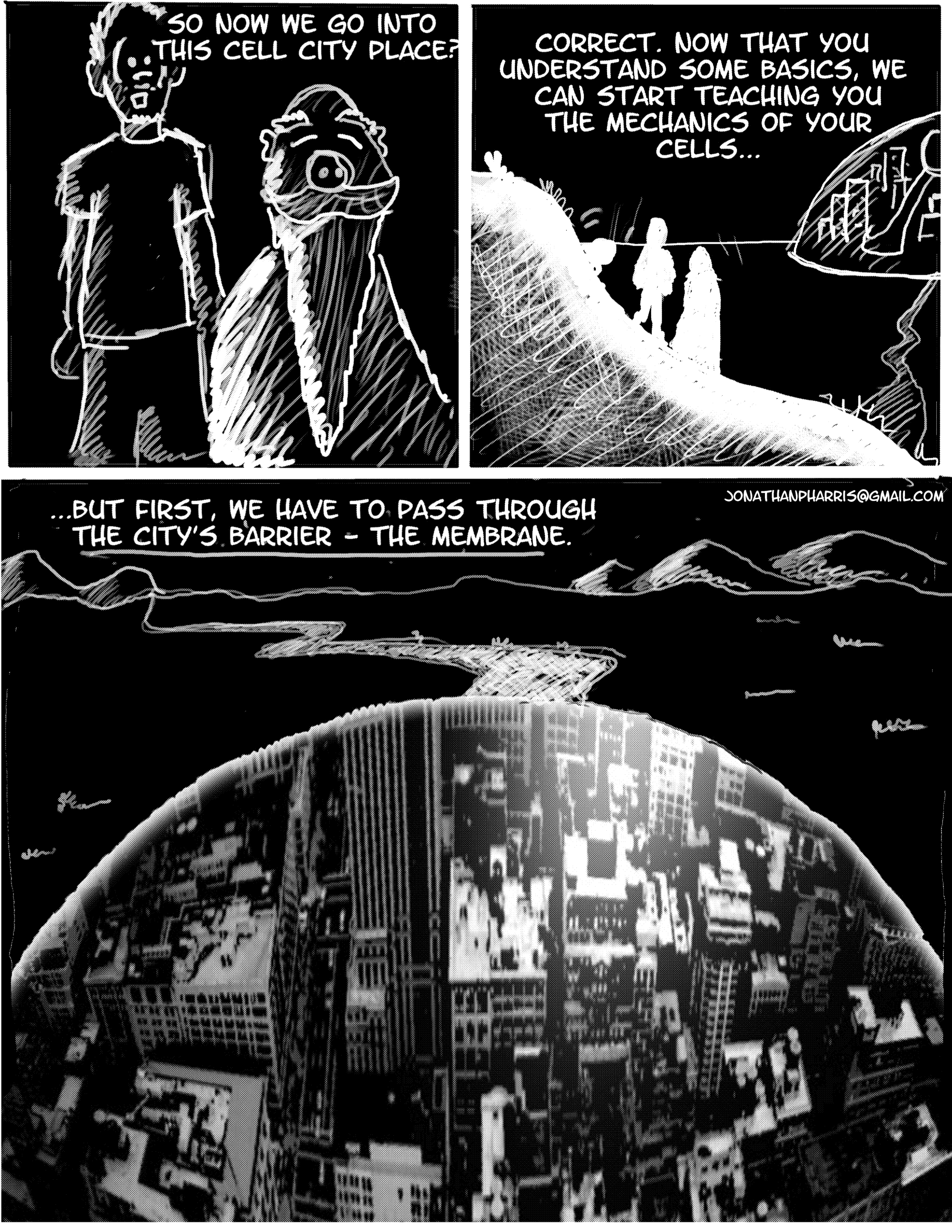
SO NOW WE GO INTO THIS CELL CITY PLACE?
CORRECT. NOW THAT YOU UNDERSTAND SOME BASICS, WE CAN START TEACHING YOU THE MECHANICS OF YOUR CELLS...
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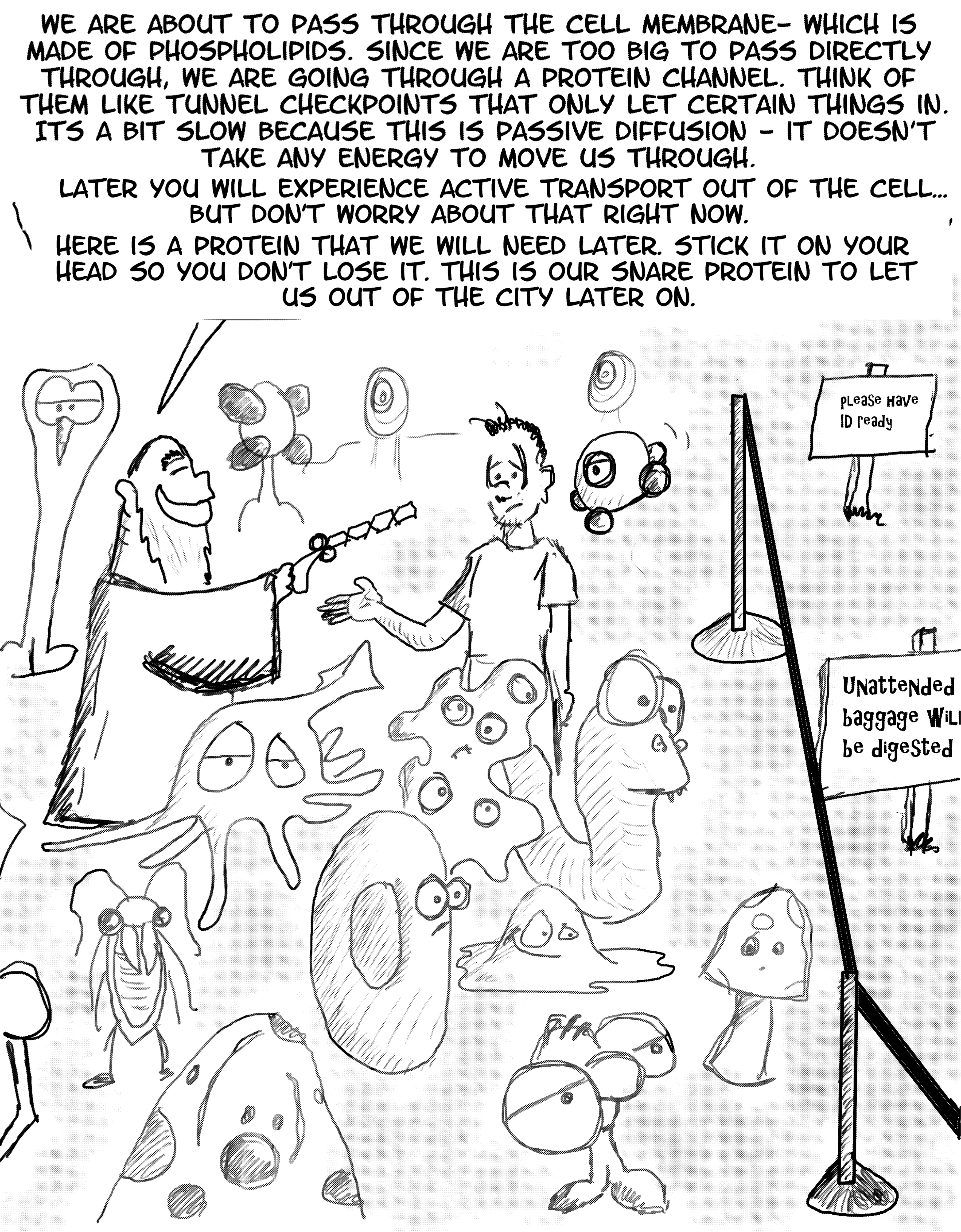
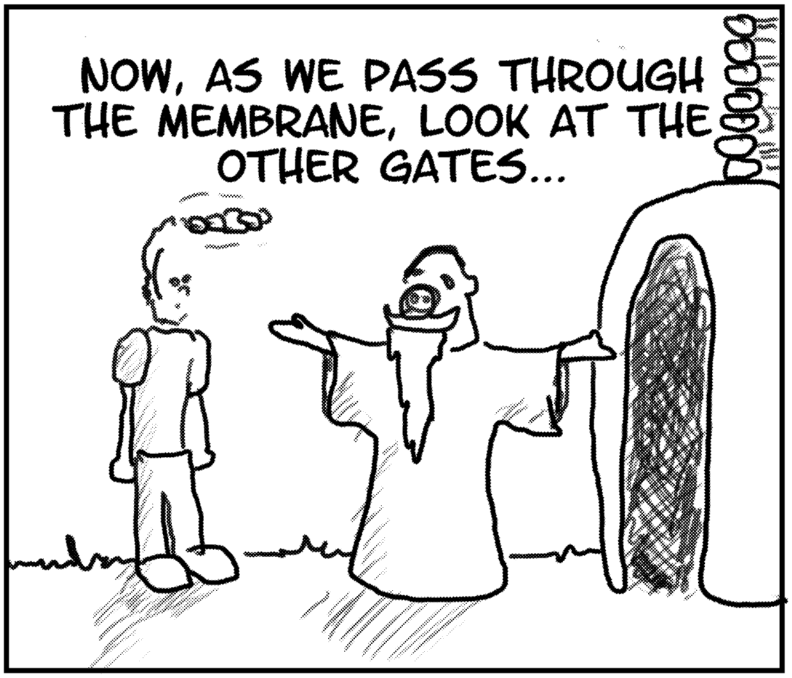
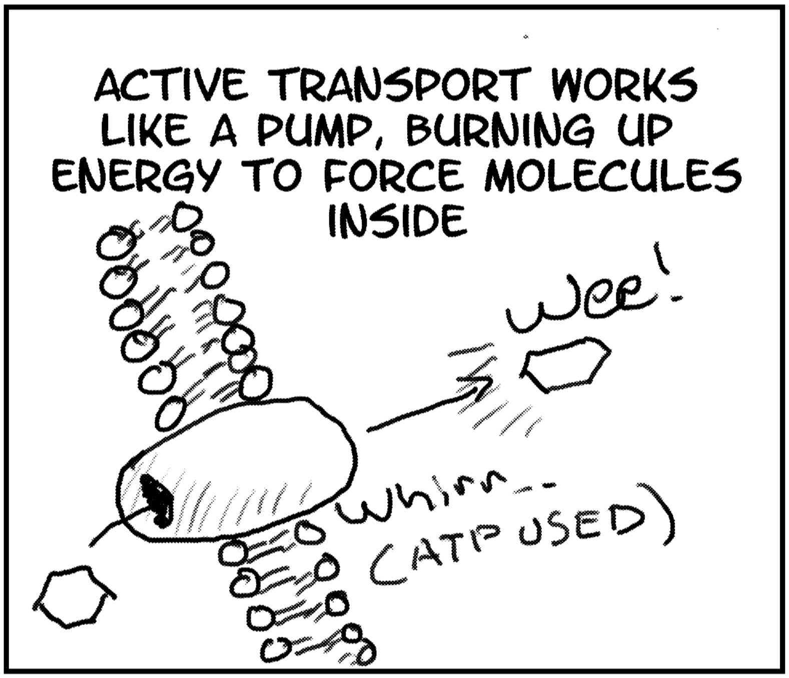
...BUT FIRST, WE HAVE TO PASS THROUGH THE CITY'S BARRIER - THE MEMBRANE.


WE ARE ABOUT TO PASS THROUGH THE CELL MEMBRANE- WHICH IS MADE OF PHOSPHOLIPIDS. SINCE WE ARE TOO BIG TO PASS DIRECTLY THROUGH, WE ARE GOING THROUGH A PROTEIN CHANNEL. THINK OF THEM LIKE TUNNEL CHECKPOINTS THAT ONLY LET CERTAIN THINGS IN. ITS A BIT SLOW BECAUSE THIS IS PASSIVE DIFFUSION - IT DOESN'T TAKE ANY ENERGY TO MOVE US THROUGH.
LATER YOU WILL EXPERIENCE ACTIVE TRANSPORT OUT OF THE CELL... BUT DON'T WORRY ABOUT THAT RIGHT NOW.
HERE IS A PROTEIN THAT WE WILL NEED LATER. STICK IT ON YOUR HEAD SO YOU DON'T LOSE IT. THIS IS OUR SNARE PROTEIN TO LET US OUT OF THE CITY LATER ON.
pLease Have ID ready
UNattended baggage Will be digested

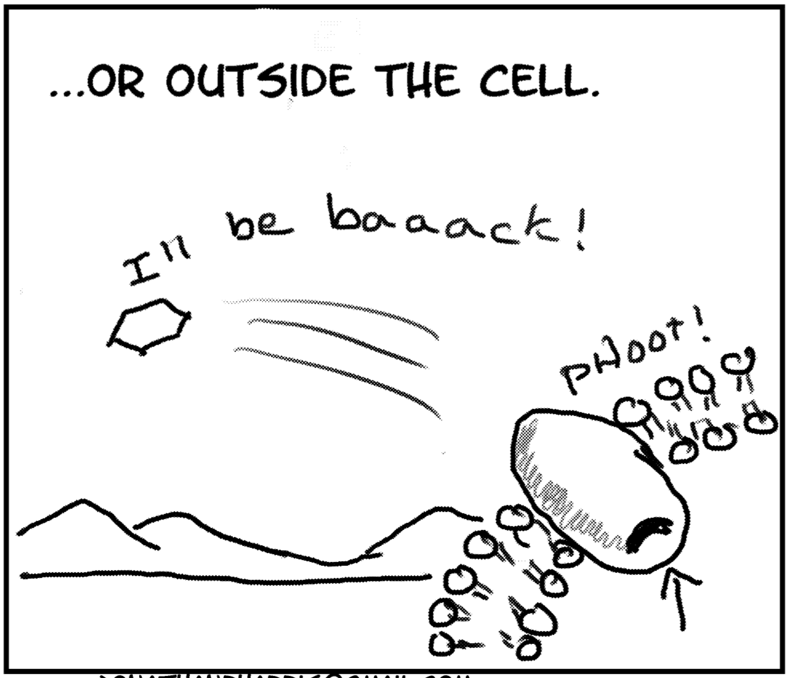


NOW, AS WE PASS THROUGH THE MEMBRANE, LOOK AT THE OTHER GATES...



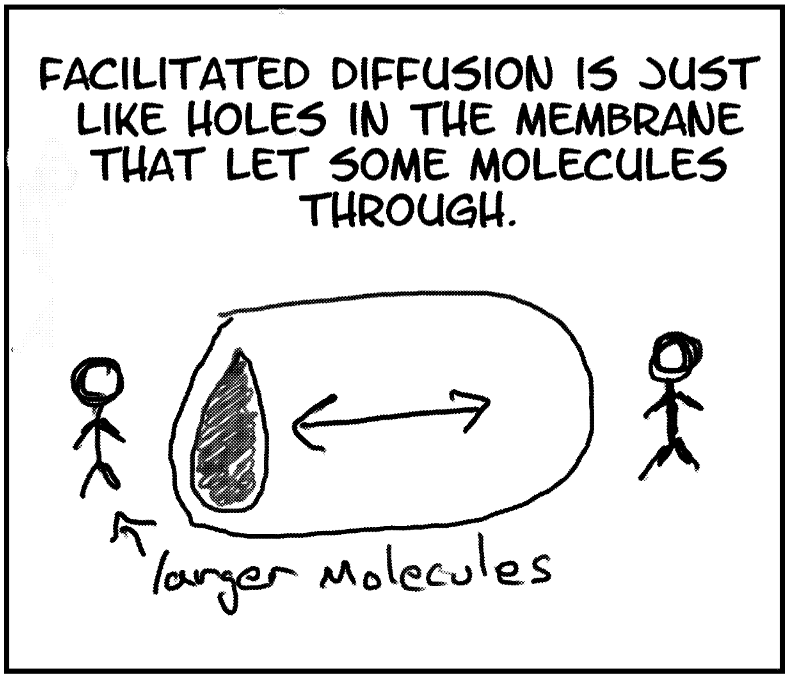
ACTIVE TRANSPORT WORKS LIKE A PUMP, BURNING UP ENERGY TO FORCE MOLECULES INSIDE

Wee!
Whirr...
(ATP USED)



...OR OUTSIDE THE CELL.

I'll be baaack!
pHOOT!



FACILITATED DIFFUSION IS JUST LIKE HOLES IN THE MEMBRANE THAT LET SOME MOLECULES THROUGH.

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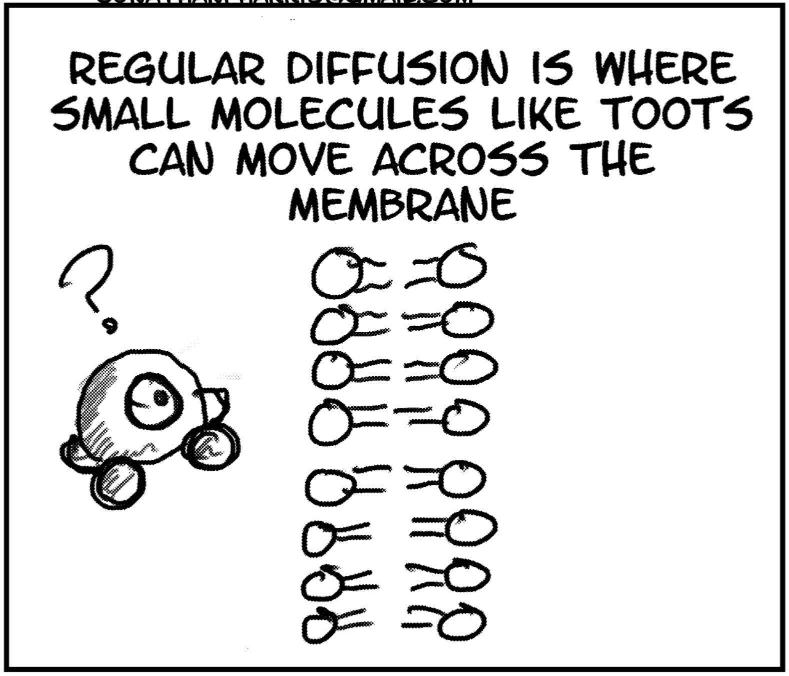
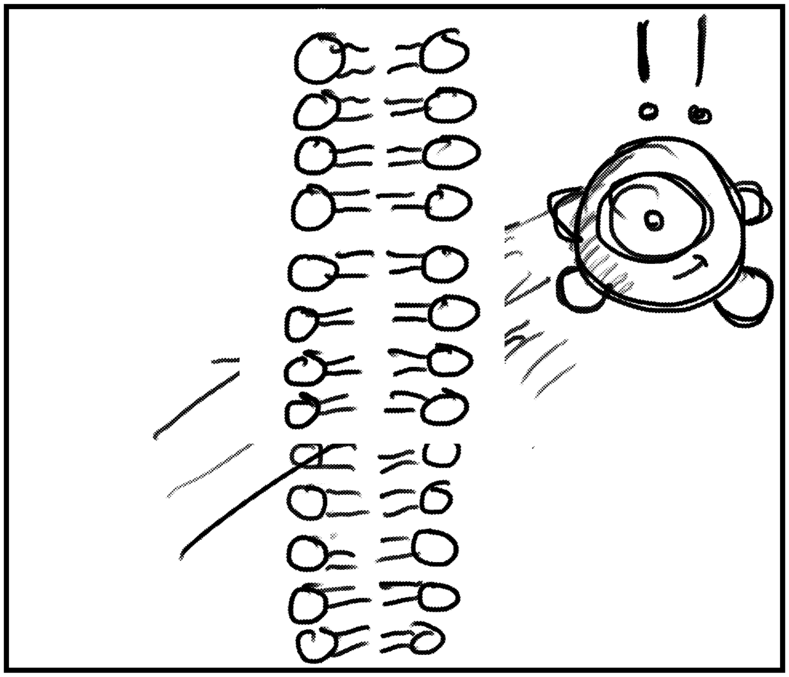
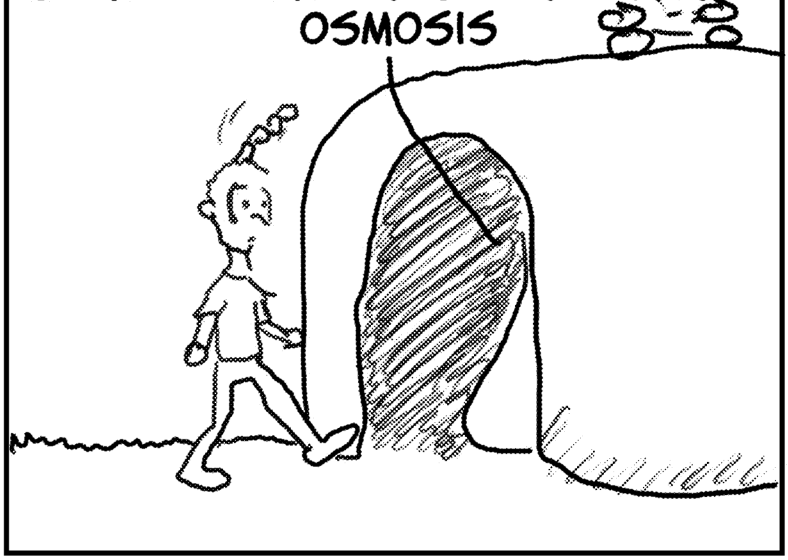


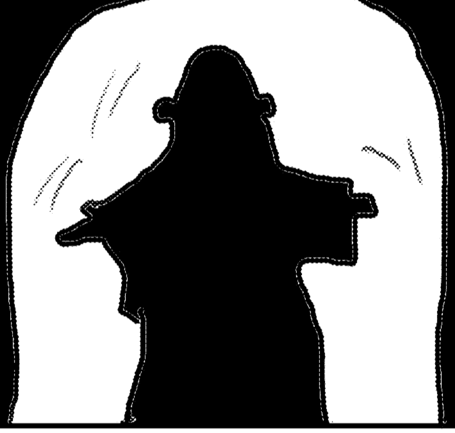
REGULAR DIFFUSION IS WHERE SMALL MOLECULES LIKE TOOTS CAN MOVE ACROSS THE MEMBRANE



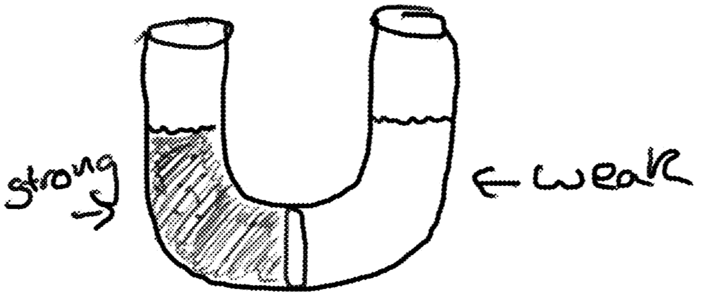
THE LAST TYPE OF TRANSPORT IS ONE OF THE MOST IMPORTANT-



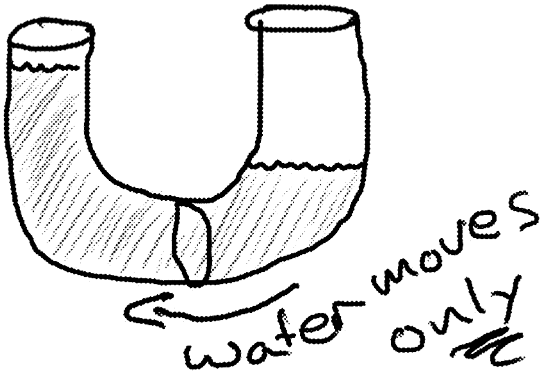
OSMOSIS IS WHERE WATER MOVES ACROSS THE MEMBRANE TO BALANCE OUT DIFFERENT CONCENTRATIONS.



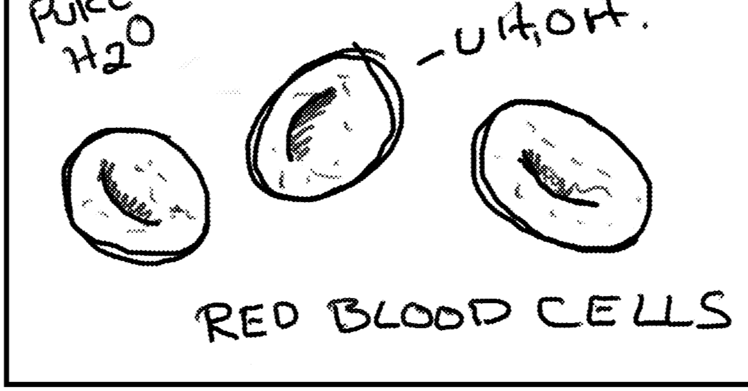
HERE WE HAVE A TUBE WITH VERY SALTY WATER ON THE LEFT, AND PURE WATER ON THE RIGHT, WITH A MEMBRANE SEPARATING THEM.



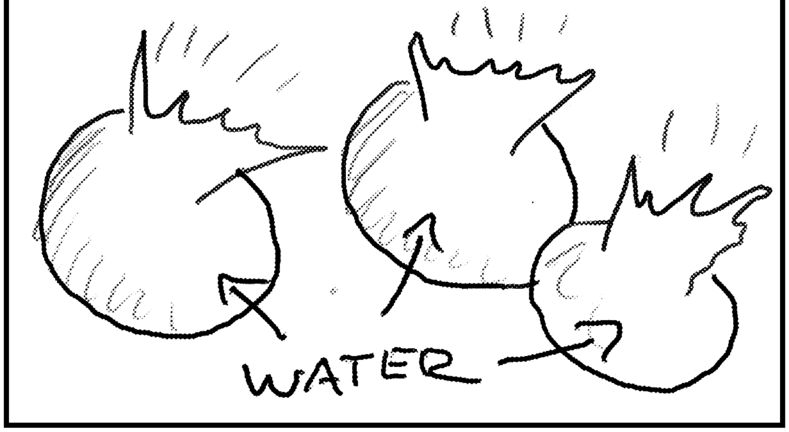
THE WATER WILL NOW MOVE THROUGH THE MEMBRANE TO BALANCE OUT THE CONCENTRATION, RAISING THE WATER LEVEL ON THE LEFT SIDE! THEY ARE BOTH EQUALLY SALTY NOW.

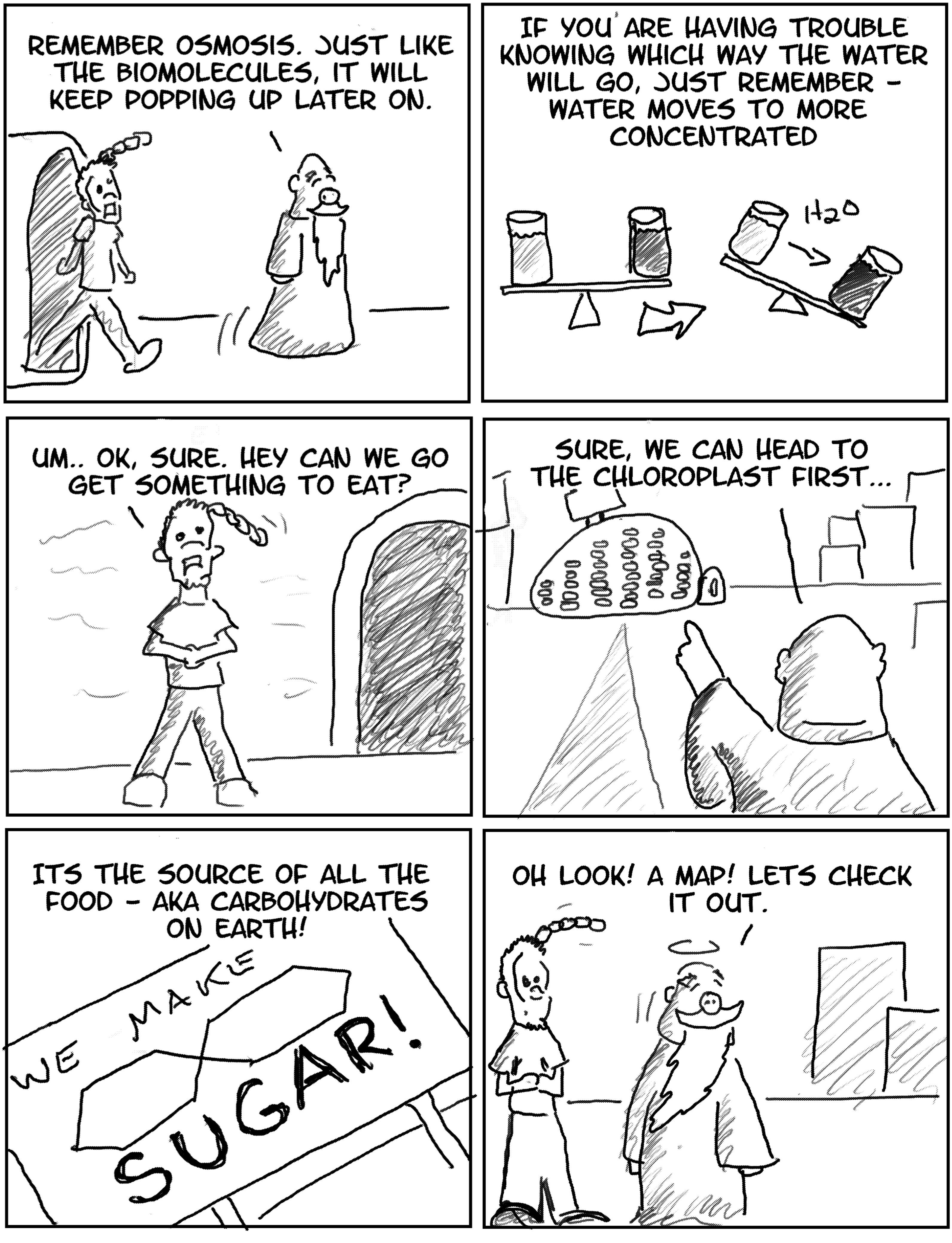


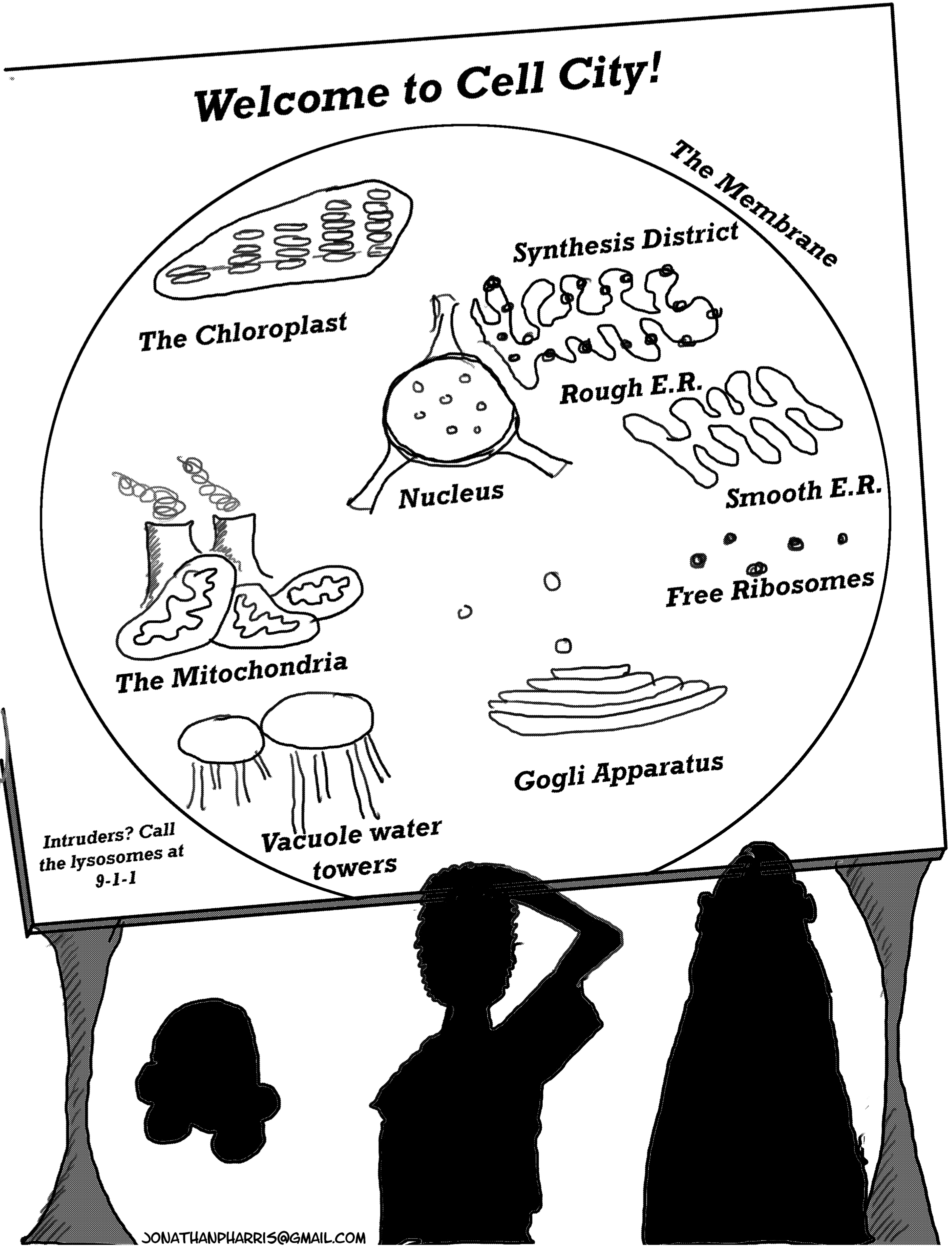
WHICH EXPLAINS WHY WHEN YOU GET AN IV, THEY USE SALINE OR SLIGHTLY SALTY WATER. IF IT WAS PURE WATER...



WATER WOULD RUSH INTO YOUR BLOOD CELLS TO EVEN OUT THE CONCENTRATION AND THEY WOULD EXPLODE.




REMEMBER OSMOSIS. JUST LIKE THE BIOMOLECULES, IT WILL KEEP POPPING UP LATER ON.
IF YOU ARE HAVING TROUBLE KNOWING WHICH WAY THE WATER WILL GO, JUST REMEMBER - WATER MOVES TO MORE CONCENTRATED
H_2O
UM.. OK, SURE. HEY CAN WE GO GET SOMETHING TO EAT?
SURE, WE CAN HEAD TO THE CHLOROPLAST FIRST...
ITS THE SOURCE OF ALL THE FOOD - AKA CARBOHYDRATES ON EARTH!
WE MAKE SUGAR!
OH LOOK! A MAP! LETS CHECK IT OUT.



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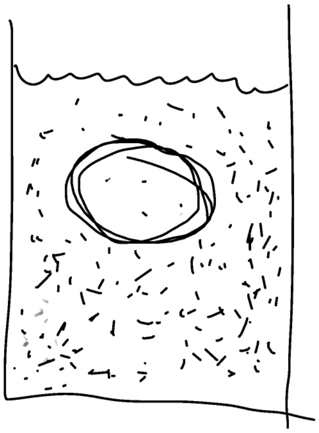
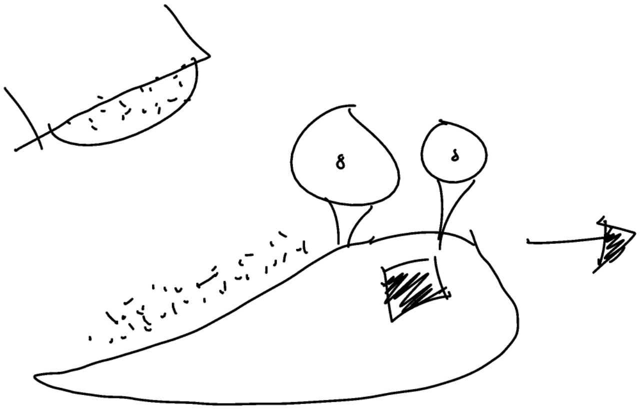
REVIEW CHAPTER 4

1. IN THE FOLLOWING PICTURE, AN ANIMAL CELL IS PLACED INSIDE VERY SALTY WATER. DRAW AND EXPLAIN THE NET MOVEMENT OF WATER



2. YOU WERE A TERRIBLE, TERRIBLE CHILD, AND PUT SALT ON SLUGS SINCE SLUGS LACK ANY DEAD SKIN LAYER LIKE YOU HAVE, POURING SALT ON THEM DRAMATICALLY INCREASES THE CONCENTRATION OUTSIDE THEIR CELLS. DRAW AND EXPLAIN WHAT HAPPENS BELOW.



3. OXYGEN AND CARBON DIOXIDE IN YOUR LUNGS WILL MOVE THROUGH YOUR LUNG-CELL MEMBRANES BY WHAT PROCESS MOST LIKELY?